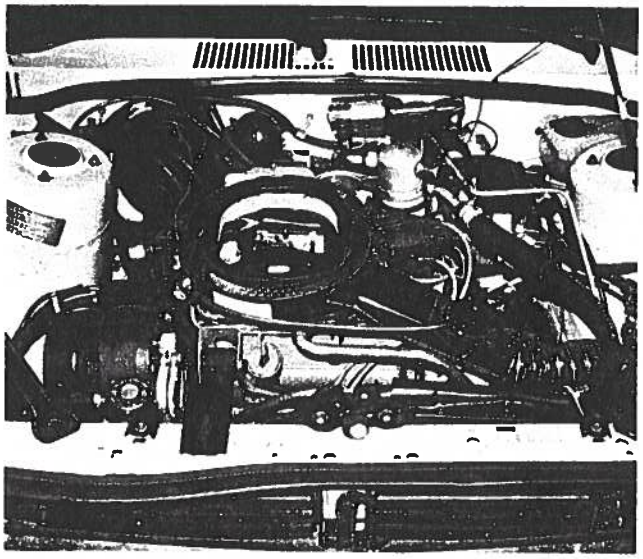
GM 173 V-6 (Chevy)

When GM decided to produce the new X-Body line of front-wheel-drive cars, they realized they would need all-new, smaller engines to power the smaller cars. They chose a 2.5-liter (151 CID) 4-cyl. engine made by Pontiac, and Chevrolet got the nod to develop a 2.8-liter (173 CID) V-6.

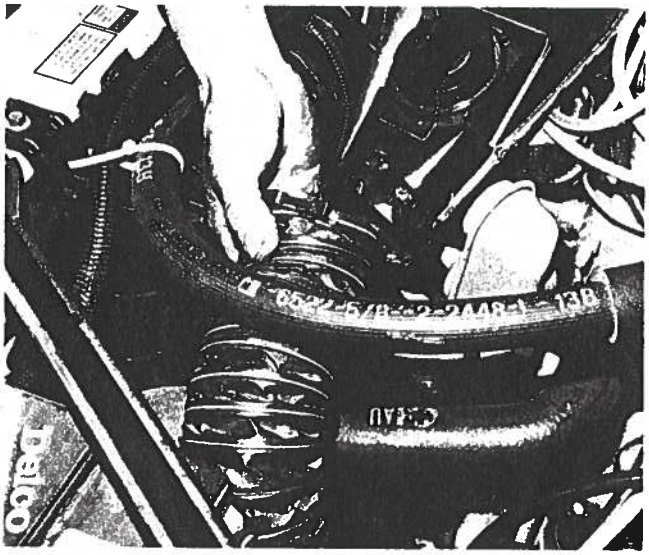
Chevrolet and Buick had both been building larger V-6's for some time. These engines were larger in displacement than GM wanted, and they were physically larger, too, being 90° V blocks. Chevrolet made the new small engine narrower, designing the V blocks at a 60° angle. With it mounted crossways in the front-wheel-drive X-Body, there was a significant gain in legroom.

A long-time favorite expression of mechanics is, "If the (expletive deleted) who designed this had to work on it, there would be a lot of changes made." Recognizing this, Chevrolet design engineers consulted with their service people in the development of this car, which resulted in a vehicle so easy to work on that insurance companies have reduced their rates on X-Bodied cars. The engine compartment appears quite crowded; it *is* but the crowding is organized so that things are accessible for a change. As an example of good planning,

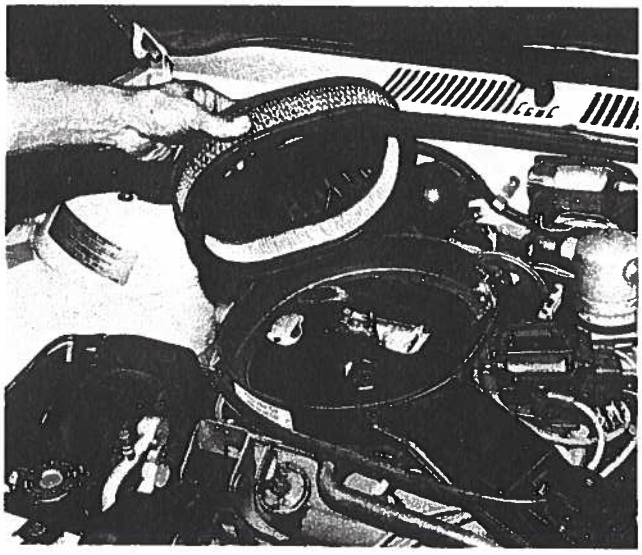
HOW-TO: Tuning Procedures



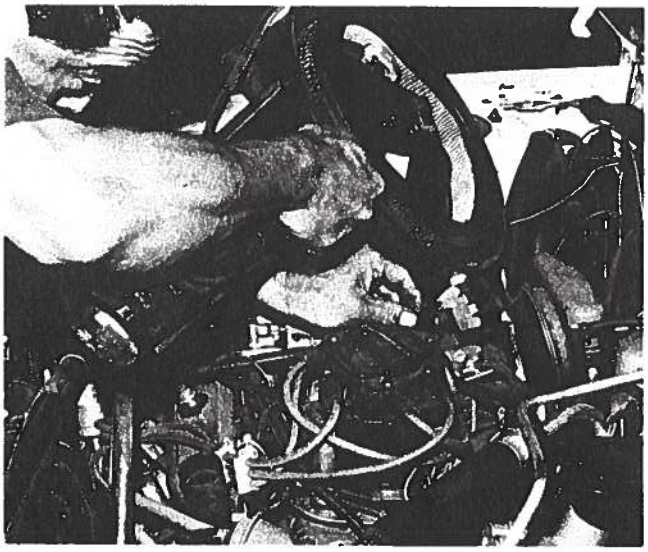
1. The engine compartment looks over-crowded, but it's actually well laid out, with better than usual accessibility.



2. After removing the cold air duct, examine it closely for rips and tears. The tube must not be stiff and brittle.



3. Replace air cleaner filter element if dirty. Wipe interior of housing. Note that there's no engine ventilation filter.

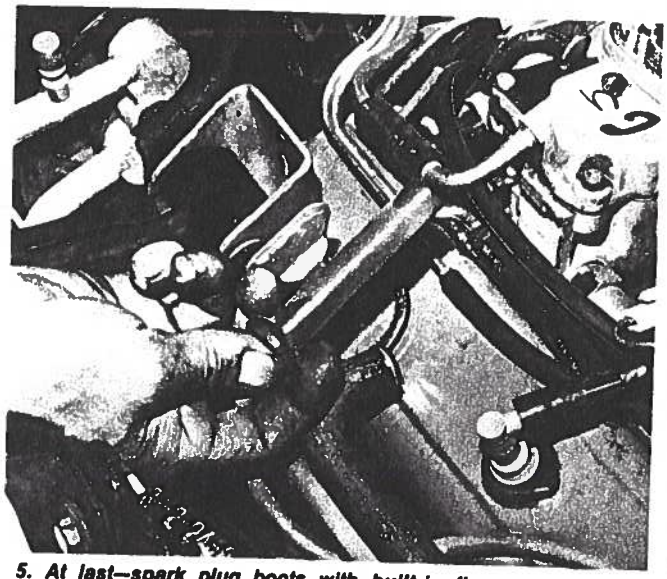


4. Pay close attention to the thermostatic vacuum valve hose connections. They must be tight and hose must be good.

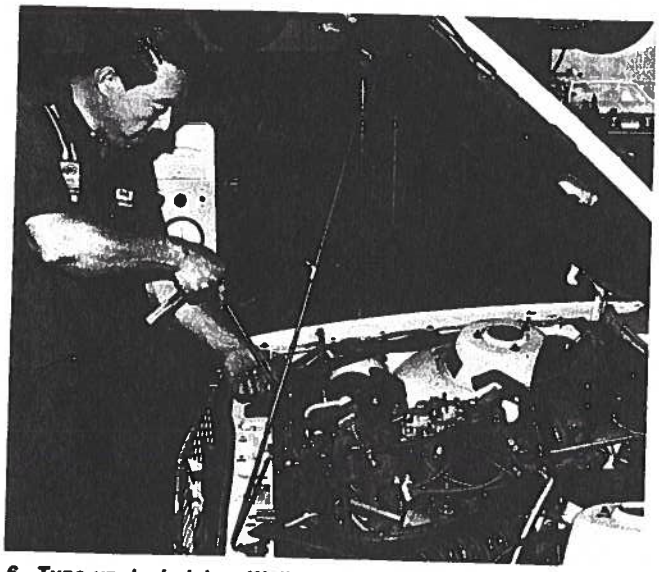
the hood can be lifted to a point where it swings back over the rear sloping windshield, giving unrestricted access to the back side of the cross-mounted engine.

We took this federal-engined Citation to Warren Biggs Chevrolet in Los Angeles, California, where service technician Wally Okazaki was kind enough to go through the tune-up procedure for our camera. Since the engine is cross-mounted, things look a bit strange; however, tune-up procedures are the same as a conventional engine. You may have to look in odd locations for some items, but otherwise everything is pretty straightforward. Because it's an '80 design, the car hasn't been on the road long enough to experience a winter in the hands of the public. Chevrolet has conducted extensive prototype testing and has corrected all the glitches they discovered, but leave it to John Q Public to find problems.

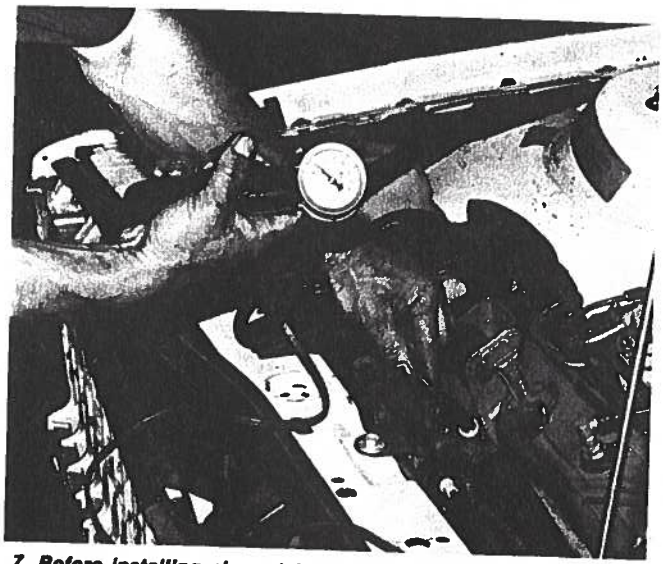
Wally, our tune-up expert, says that the thermostatically controlled cooling fan is about the only thing you will find that is really different. The fan comes on at a preset/coolant temperature and stays on until the coolant drops back to the preset temperature. If the car is air-conditioned, the cooling fan will come on automatically when the air conditioning is turned on. This is a reliable way to test the fan's operation. Bypass the fan relay to test non-air-conditioned car fans. If the engine ever overheats, always check the fan circuits first to be sure the fan is operating properly. There are virtually no adjustments that can be made on these all-new carburetors other than curb idle and fast idle—the air/fuel ratio adjusting screws are sealed. This being a federal engine, it has no electronic emissions sensors. California cars have an electronic Black Box emissions controlling sensing system that utilizes an exhaust oxygen sensor to control air/fuel ratio.



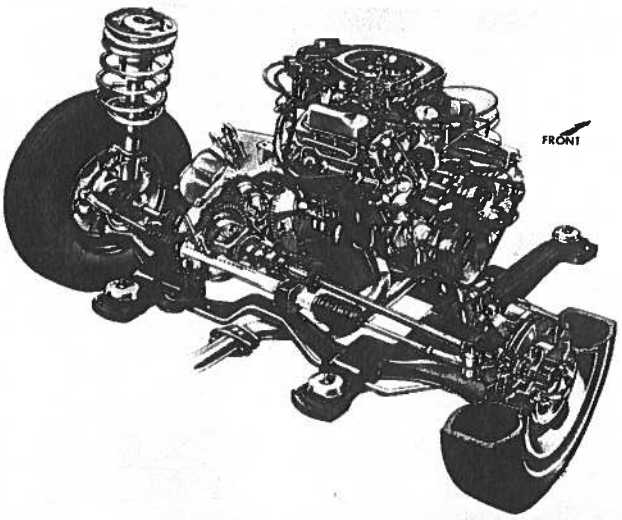
5. At last—spark plug boots with built-in finger grips. Twist and pull on boots only; inspect for cracks and arcing.



6. Tune-up technician Wally Okazaki uses a long extension and a U-jointed deep socket to remove the spark plugs.



7. Before installing plugs, take a compression reading at each cylinder. Wide pressure variations indicate trouble.



8. The cylinder placement of the X-body V-6 makes the block shorter and allows for a compact engine compartment.

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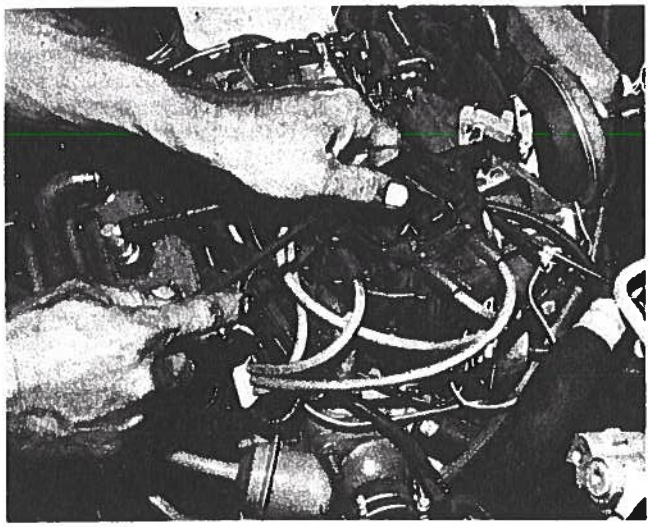
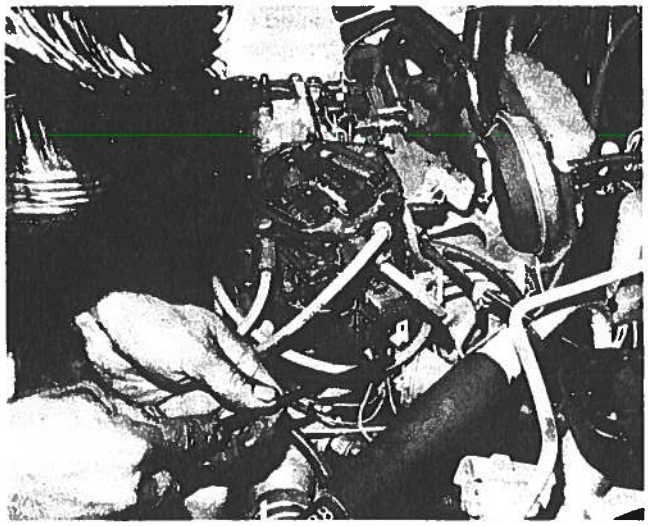
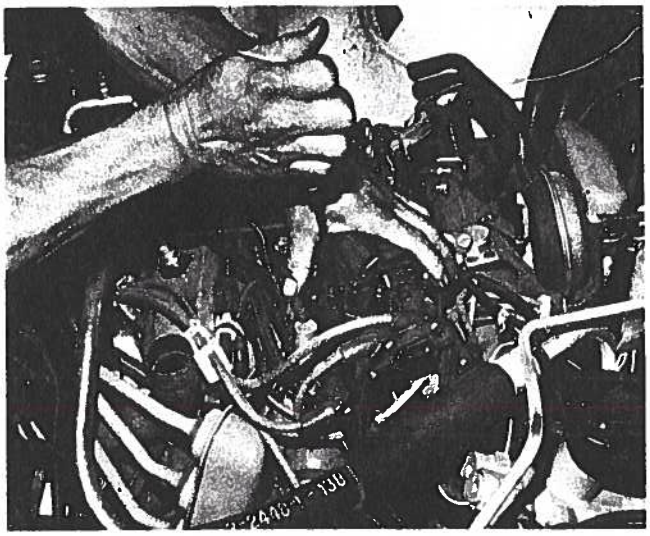


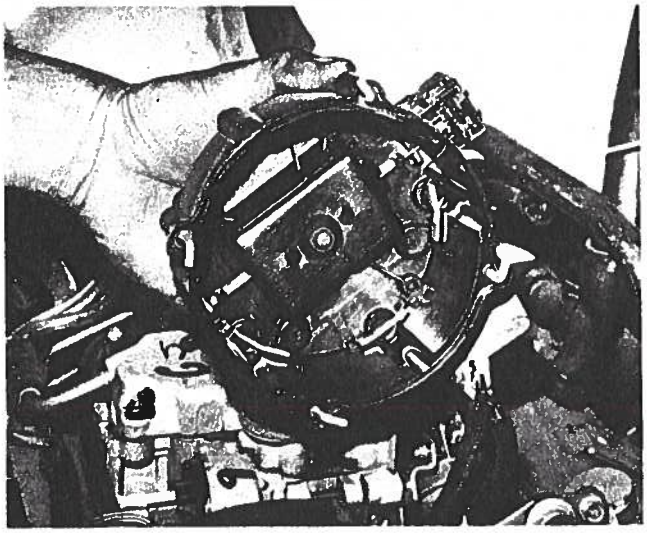
9. For easy access to distributor, remove the ignition wire holding crown first. Release metal clips at each side.



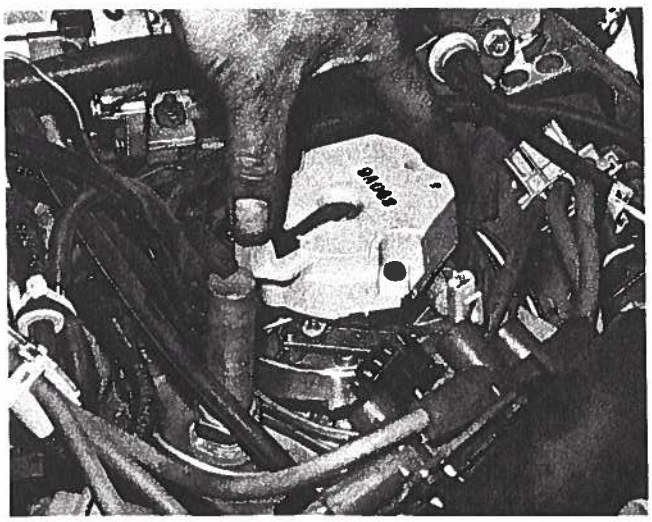
10. Release holding snaps. Remove ignition wire and tach connections from distributor cap and diagram connections.



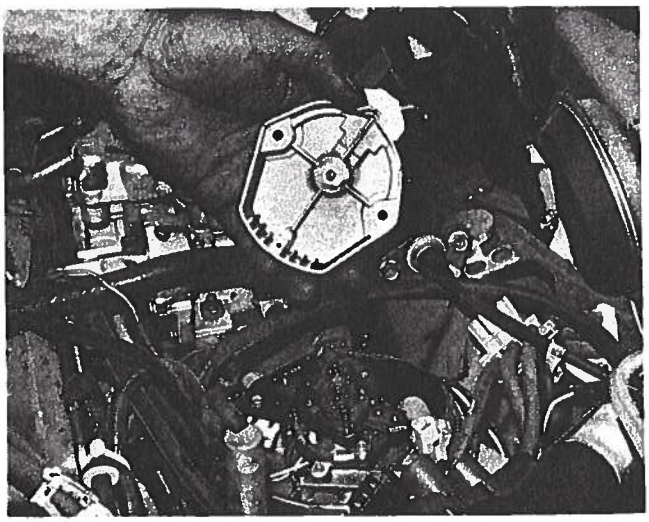
11. Using a long screwdriver, depress four circumferential latches and turn each ½-turn to release distributor cap.



12. Remove cap and examine for rust dust, cracks and corrosion. Check carbon button for wear; clean all terminals.

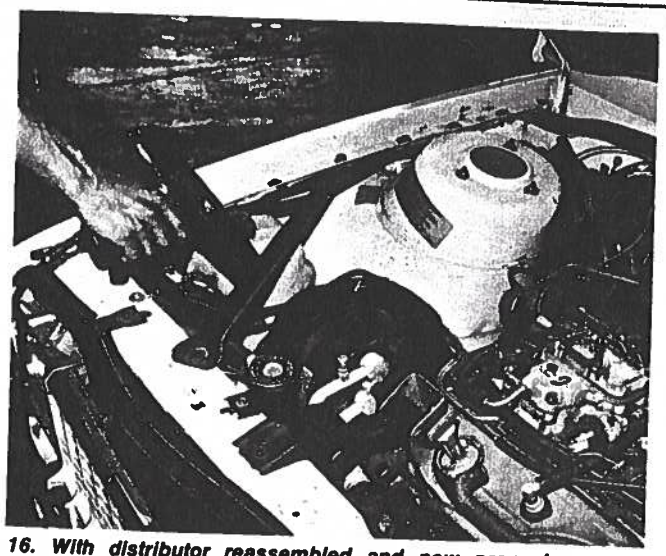


13. Twist rotor and release; it should move and spring back. If not, shaft bushing is frozen, so you'll have to replace shaft.

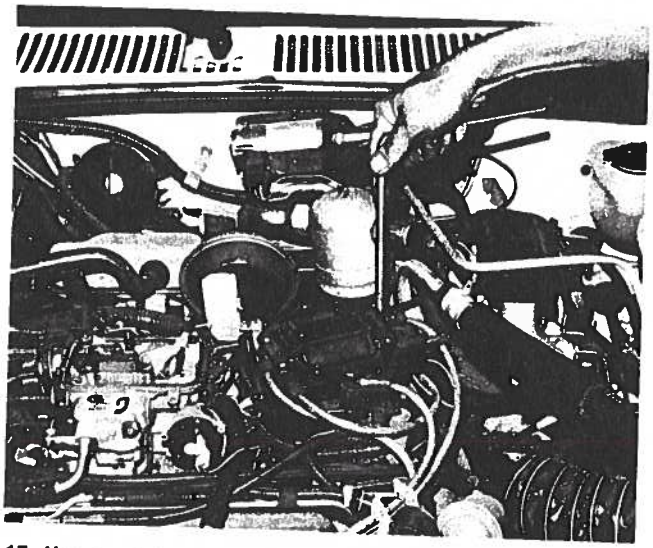


14. After removing two screws, lift rotor off advance weights. Inspect rotor for arcing at center and wipe out rust dust.

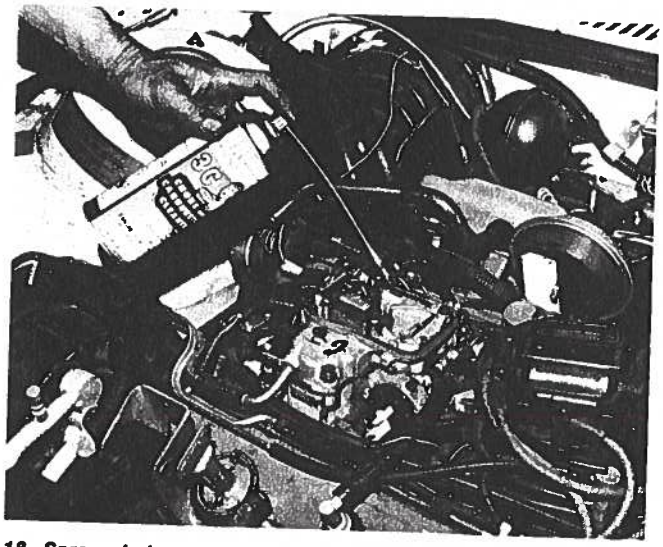
15. Check advance mechanism for free movement. Remove springs and weights. Clean and lube with cam lubricant.



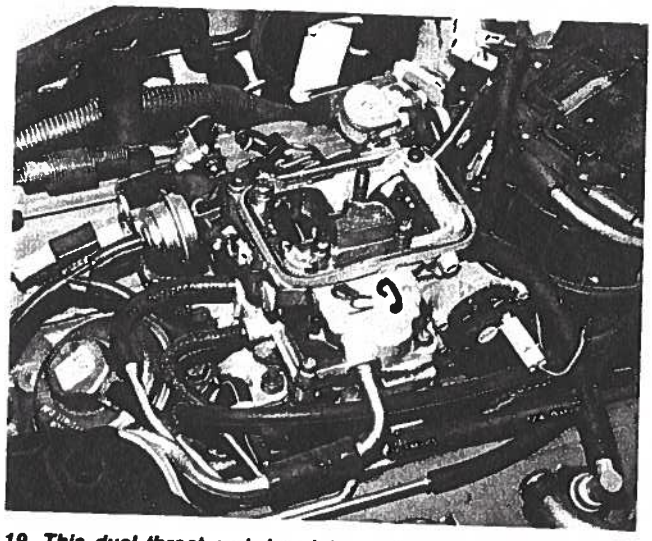
16. With distributor reassembled and new properly gapped plugs installed, start engine and check ignition timing.



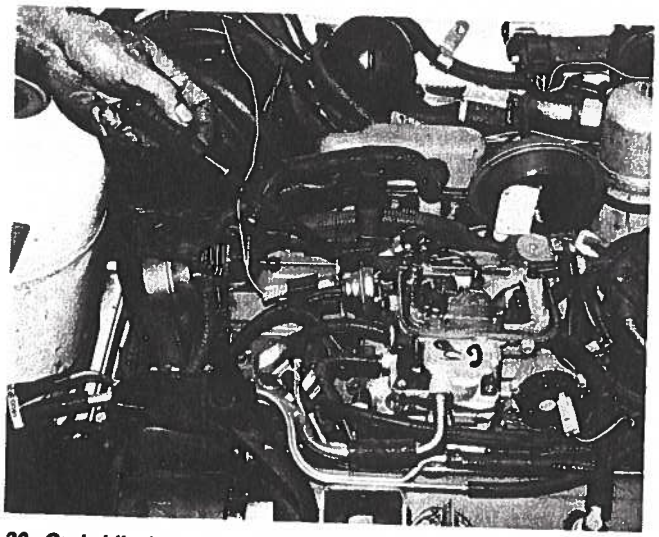
17. Use an offset wrench to reach and loosen distributor hold-down bolt. Distributor can be moved to adjust timing.



18. Spray choke/carburetor cleaner on linkage and shafts to remove accumulated gum or varnish. Shafts must be free.

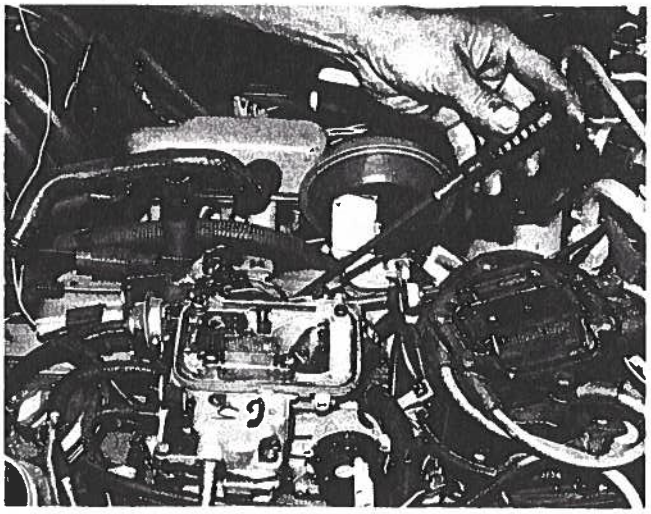


19. This dual throat carb has lots of vacuum hoses that must be kept in good condition and tightly connected.

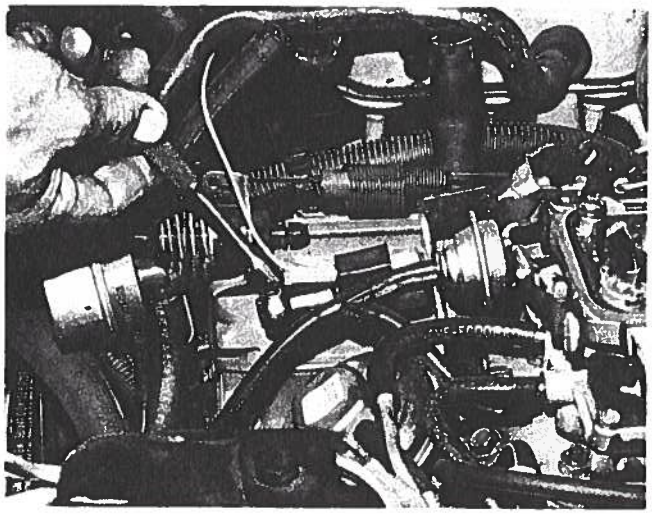


20. Curb idle is adjusted by a spring-loaded throttle stop set-screw. Throttle cable enters right; setscrew faces left.

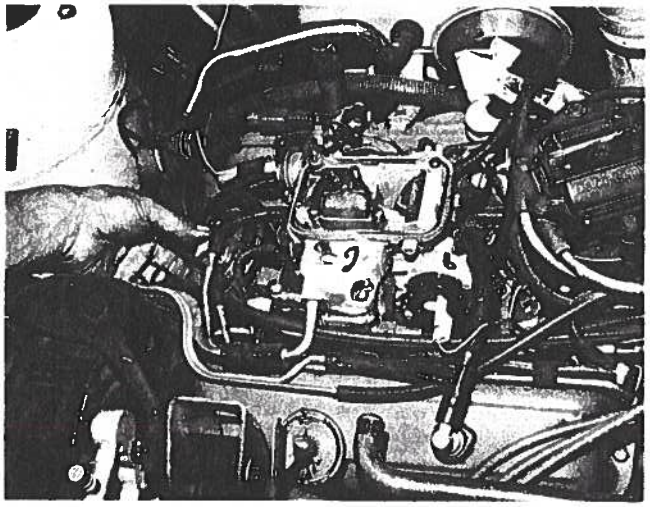
HOW-TO: Tuning Procedures



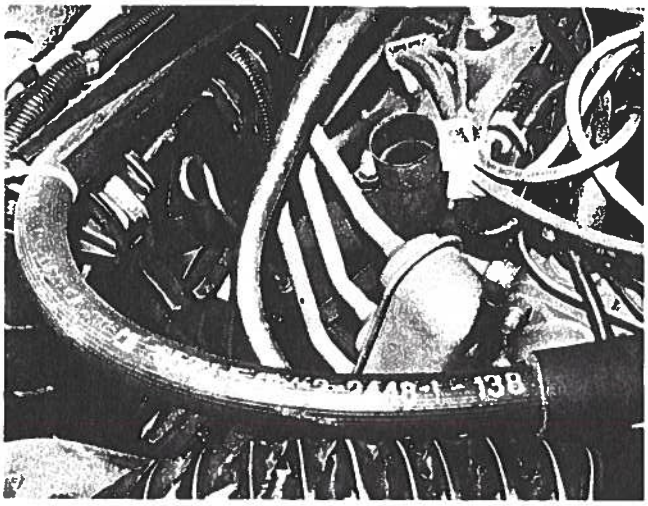
21. Fast idle is adjusted with setscrew of choke linkage on lowest step of the fast idle stepped wedge; see specs.



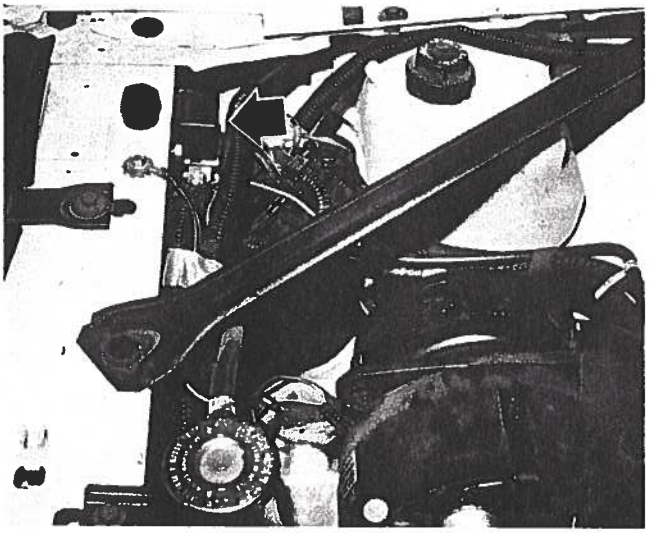
22. Air-conditioned cars have a fast idle solenoid. Turn AC on and adjust solenoid plunger via setscrew at top of solenoid.



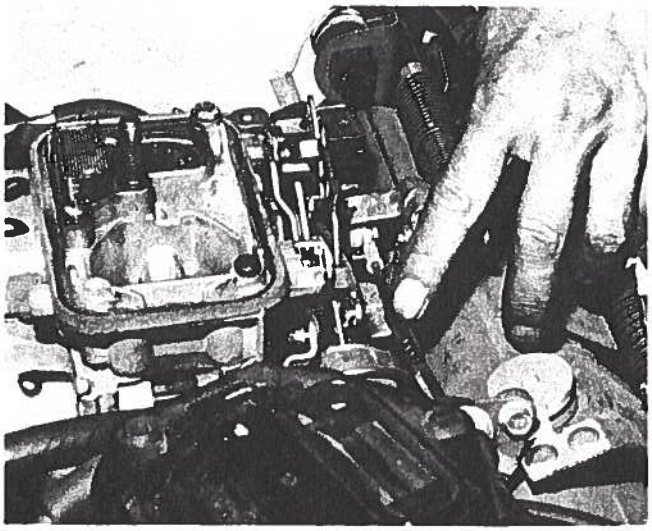
23. Place finger under EGR valve to feel diaphragm. Blip engine, diaphragm should move. If not, remove and clean EGR.



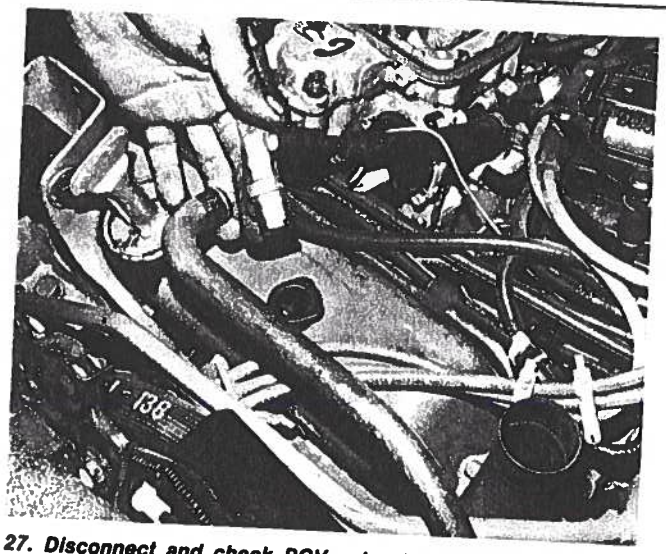
24. To test operation of thermostatically controlled electric fan, turn on AC. Fan should come on; if not, check circuits.



25. Test cooling fan operation on non-AC cars with a short jumper wire to bypass fan relay mounted over vapor canister.

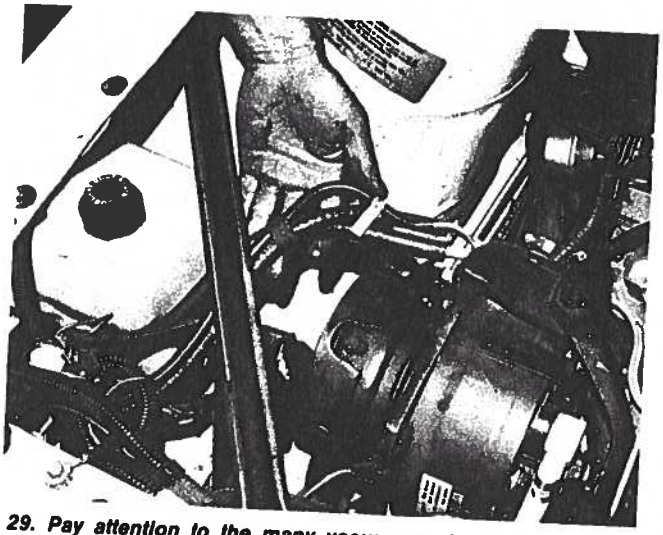


26. With controls in close quarters, check cables and linkages for freedom of movement. Check throttle cable.

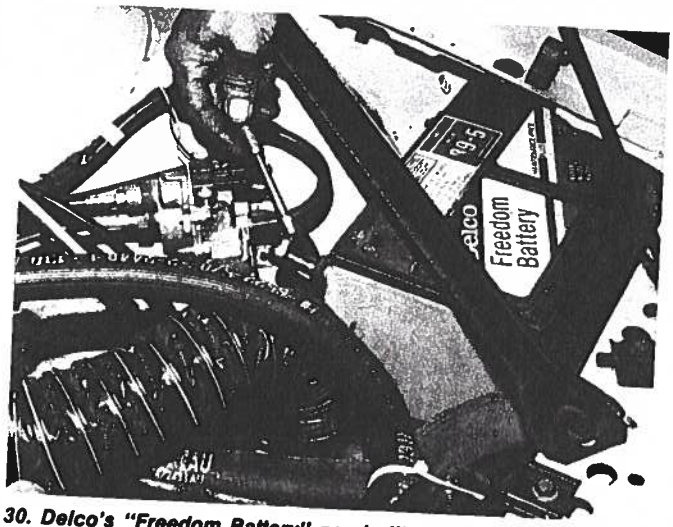


27. Disconnect and check PCV valve in forward valve cover. Vacuum should be present at idle; if not, clean in solvent.

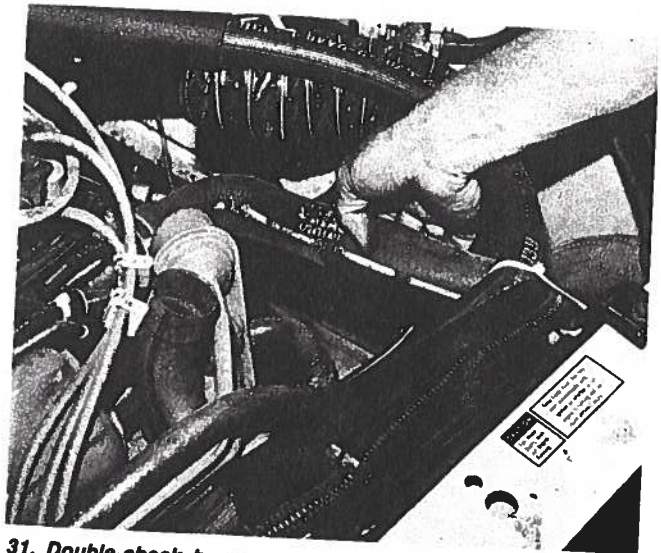
28. Inspect all V belts for age and wear, replacing frayed or cracked belts. Belt tension must be kept correct.



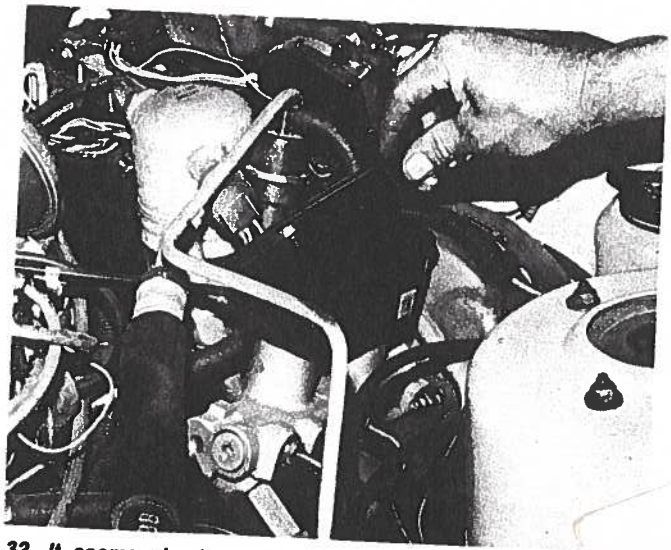
29. Pay attention to the many vacuum and vapor hoses. Replace if cracked, stiff or brittle and keep connections tight.



30. Delco's "Freedom Battery" needs little attention other than keeping connections clean and tight; grease them.



31. Double-check hoses, radiator and heater; since system is pressurized, weak or cracked hoses can fail unexpectedly.



32. It seems simple, but it's a life-and-death matter. C brake master cylinder reservoir and fill with DOT #3 fluid.